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Tears of Cruciate Ligaments of the Knee, US Armed Forces, 1990-2002

The knee is a hinge joint whose stability and function are maintained by four ligaments that attach the femur to the tibia. The cruciate ligaments (anterior and posterior) are short fibrous cords that cross each other inside the joint. They prevent forward and backward movements of the tibia under the femur and guide the tibia over the end of the femur throughout the knee's range of motion. When cruciate ligaments are torn, the knee loses stability. If complete tears are not repaired, there are increased risks of damage to the "shock absorbing" structures (cartilage) of the knee and, eventually, increased risks of arthritis.

Injuries to cruciate ligaments typically occur during sudden hyperextensions, hyperflexions, and twists of the knee (e.g., flat-footed landings from falls and jumps, sudden stopping from running, twisting falls). Not surprisingly, participants in sports that require running with sudden stops, quick changes of direction, jumping, twisting, and falling (e.g., basketball, soccer, volleyball, football, rugby, lacrosse, alpine skiing) have relatively high risks of cruciate ligament tears. Numerous recent medical and popular press reports have focused attention on tears of cruciate (particularly anterior) ligaments of the knee, especially among young female athletes.[1-5]

Military physical and tactical training activities (chiefly under heavy loads) such as forced marches, cross country runs, obstacle courses, and parachute landing falls are inherently hazardous to the cruciate ligaments of the knee. Based on reviews of hospitalizations for physical training and sports-related injuries of US Army soldiers from 1989-1994, Lauder and colleagues reported that the knee and the anterior cruciate ligament (ACL) were the most frequently injured body area and body part, respectively.[6] During the period 1991-1997, Gwinn and colleagues documented 159 incident ACL injuries among midshipmen at the U.S. Naval Academy. The incidence rate overall was 2.4 times higher among females than males; and during presumed high-risk military training activities (i.e., instructional wrestling, obstacle course), the rate of ACL injuries was 9.7 times higher among females than males.[7] Recently, Uhorchak and colleagues documented 24 noncontact ACL tears during a four year prospective followup of 859 cadets at the U.S. Military Academy. The cumulative incidence of noncontact ACL tears was 2.8% overall and was approximately 3 times higher among females (6.6%) than males (2.1%).[8]

However, there have not been assessments of rates and trends of cruciate ligament tears in active duty members of the US Armed Forces in general. For this report, we assessed all medical encounters of active duty servicemembers to estimate frequencies, incidence rates, trends, and demographic correlates of risk of cruciate ligament tears from 1990 through 2002.

Methods. There are 3 diagnoses in the International Classification of Diseases, 9th revision, Clinical Modifications (ICD-9-CM) that are specific for, or suggestive of, tears of cruciate ligaments of the knee: "old disruption of anterior cruciate ligament" (ICD-9-CM 717.83); "old disruption of posterior cruciate ligament" (ICD-9-CM 717.84); and "sprains and strains of knee and leg, cruciate ligament of the knee" (ICD-9-CM 844.2) which includes "lacerations," "ruptures," and "tears" (per ICD-9-CM coding guidelines). In addition, 7 procedure codes (ICD-9-CM codes [in patient procedures]; Current Procedural Terminology (CPT) codes [out patient procedures]) are specific for, or suggestive of, surgical repair of a cruciate ligament of the knee (when used in conjunction with relevant diagnosis codes): "triad knee repair: medial meniscectomy with repair of the anterior cruciate ligament and the medial collateral ligament" (ICD-9-CM 81.43); "other repair of the cruciate ligaments" (ICD-9-CM 81.45); "tendon graft" (ICD-9-CM 83.81); "arthroscopically aided anterior cruciate ligament repair/augmentation or reconstruction" (CPT 29888); "arthroscopically aided posterior cruciate ligament repair/augmentation or reconstruction'' (CPT 29889); "repair, primary, torn ligament and/or capsule, knee; cruciate" (CPT 27407); "repair, primary, torn ligament and/or capsule, knee; collateral and cruciate ligaments'' (CPT 27409).

For this report, the surveillance period was defined as 1 January 1990 to 31 December 2002. Records of the Defense Medical Surveillance System (DMSS) were searched to identify all hospitalizations

Table 1. Incidence rates of "probable" and "possible" cruciate ligament tears* by demographic characteristics, active duty, US Armed Forces, 1990-2002

	Probable tear			Possible tear		
	No.	Rate per 100,000 p-y	Rate ratio	No.	Rate per 100,000 p-y	Rate ratio
Total	28,312	139.9	n/a	46,065	227.6	n/a
Gender						
Male	25,811	146.3	1.5	41,008	232.5	1.2
Female	2,498	96.4	ref	5,040	194.5	ref
Age group						
<20	1,054	65.8	ref	2,568	160.4	ref
20-24	10,168	157.9	2.4	14,191	220.4	1.4
25-29	7,726	178.4	2.7	10,202	235.6	1.5
30-34	5,026	150.1	2.3	7,450	222.5	1.4
35-39	3,132	115.7	1.8	6,892	254.5	1.6
40 and over	1,206	66.6	1.0	4,762	262.9	1.6
Race						
White	20,393	141.3	1.1	31,741	220.0	0.9
Black	5,398	133.3	ref	10,249	253.1	ref
Other	2,064	169.1	1.3	3,028	248.1	1.0
Rank						
E1-E4	13,501	148.1	1.7	20,588	225.8	1.0
E5-E9	10,898	136.7	1.6	18,904	237.1	1.1
O1-O3(W1-W3)	2,883	146.4	1.7	3,905	198.4	0.9
O4-O9(W4-W5)	1,020	86.5	ref	2,649	224.8	ref
Service						
Army	10,183	149.7	ref	20,227	297.3	ref
Navy	7,299	126.4	0.8	10,086	174.7	0.6
Air Force	6,969	130.4	0.9	8,722	163.2	0.5
Marines	3,861	166.7	1.1	7,030	303.4	1.0
Marital status						
Married	16,057	139.7	ref	26,912	234.2	ref
Single	11,165	140.1	1.0	17,200	215.8	0.9
Other	1,069	155.5	1.1	1,888	274.6	1.2

* Hospitalization and outpatient records, any diagnosis, ICD-9-CM 717.83, 717.84, or 844.2

(during the surveillance period) and ambulatory visits (since 1998) of active duty US servicemembers that resulted in a diagnosis specific for, or suggestive of, a tear of a cruciate ligament of the knee. A "probable" case was defined as an active duty servicemember with a diagnosis specific for or suggestive of a tear of a cruciate ligament of the knee and a procedure code specific for/suggestive of a surgical repair of a torn cruciate ligament of the knee. A "possible" case was defined as an active duty servicemember with a diagnosis, but not a procedure code, indicative of a tear of a cruciate ligament of the knee. For surveillance purposes, the date of the first medical encounter with a cruciate ligament injury-specific diagnosis, regardless of whether or when a repair was performed, was considered the date of the injury.

Results: During the surveillance period, 74,377 active duty servicemembers had a total of 435,432 inpatient and outpatient medical encounters with diagnoses specific for or suggestive of tears of cruciate ligaments of the knee (table 1). For surveillance purposes, 38% (n=28,312) of all affected servicemembers were considered "probable" cases and the remainder (n=46,065) were considered "possible" cases (table 1).

The crude incidence rate of a cruciate ligament tear overall (probable and/or possible) during the period was 367.5 per 100,000 person-years. From the beginning of the surveillance period through the mid-1990s, rates of "probable" tears steadily increased while rates of "possible" tears decreased (figure 1). However, from 1998 (when ambulatory records became widely available) through 2002, rates of both "probable" and "possible" tears sharply decreased (figure 1).

Overall, males had higher rates than females of both "probable" and "possible" cruciate ligament tears (table 1). In addition, during each year of the surveillance period, males had higher crude rates of "probable" and "possible" cruciate ligament tears than females (figure 1).

The highest number of cruciate ligament tears occurred among servicemembers 20-24 years old (table 1); however, the highest rate was among servicemembers 25-29 years old. Of note, among servicemembers younger than 20, females had a slightly higher rate of "probable" tears and a substantially higher rate of "possible" tears than their male counterparts (figure 2). In addition, after age 30, rates of "probable" tears tended to decrease with age, while rates of "possible" tears tended to increase with age (particularly among females) (figure 2).

Finally, soldiers and Marines had higher rates of cruciate ligament tears than airmen and sailors, both overall (table 1) and in each gender and age-defined subgroup (data not shown).

Editorial comment. Several findings of this surveillance may be informative and useful. First, as expected, cruciate ligament tears are relatively common injuries among active duty servicemembers, overall as well in all demographic subgroups. Second, rates of cruciate ligament tears have declined sharply among US servicemembers since 1998 (when ambulatory data were routinely available). Third, rates of "probable" tears (i.e., relevant diagnosis plus surgical repair) are highest among servicemembers in their late 20's, while rates of "possible" tears (i.e., relevant diagnosis but no surgical repair) continue to increase with age beyond age 30 (particularly among females). Fourth, in general, rates of cruciate ligament tears are higher among males than females. Of note, however, rates of cruciate ligament tears (particularly "possible" tears) are higher among teenaged females than teenaged males. Finally, rates of cruciate ligament tears are higher in the Army and Marines than in the Navy and Air Force.

The findings of this surveillance should be interpreted with consideration of several significant limitations. For example, the surveillance case definitions are not specific for incident ("new") cruciate ligament tears (the intended endpoint of the surveillance) because there are no ICD-9-CM diagnostic codes that are specific for acute tears. Thus, for surveillance purposes, we established definitions for "probable" and "possible" cases that were based on codes (and combinations of codes) for "old" disruptions of cruciate ligaments, "sprains and strains" (which include "tears" per coding guidelines), and surgical repairs. As a result, it is likely that some old tears and some acute injuries of cruciate ligaments other than tears were included as "incident cases" for this surveillance. It is also likely that the completeness and accuracy of diagnosing and reporting cruciate ligament tears changed over the surveillance period: for example, as ambulatory record systems were automated; as diagnoses and procedures in outpatient settings became more frequent and/or more completely reported; and as diagnostic technologies

Figure 1. Incidence rates of "probable" and "possible" cruciate ligament tears, by gender and year, active duty, US Armed Forces, 1990-2002.

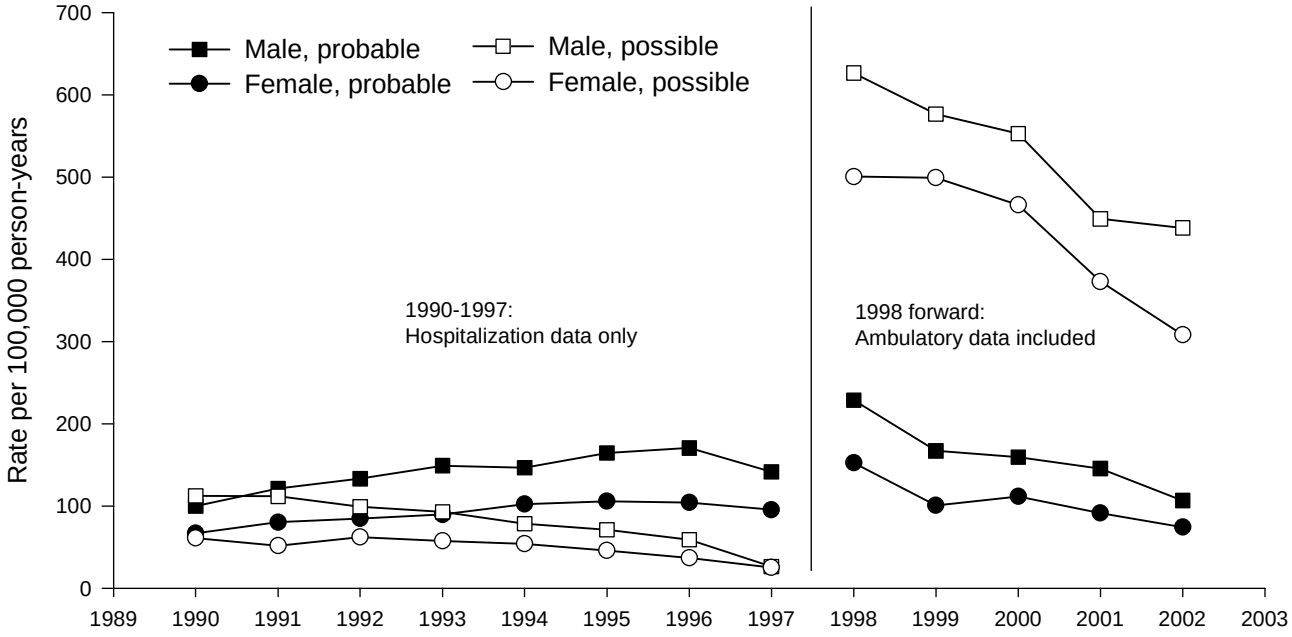
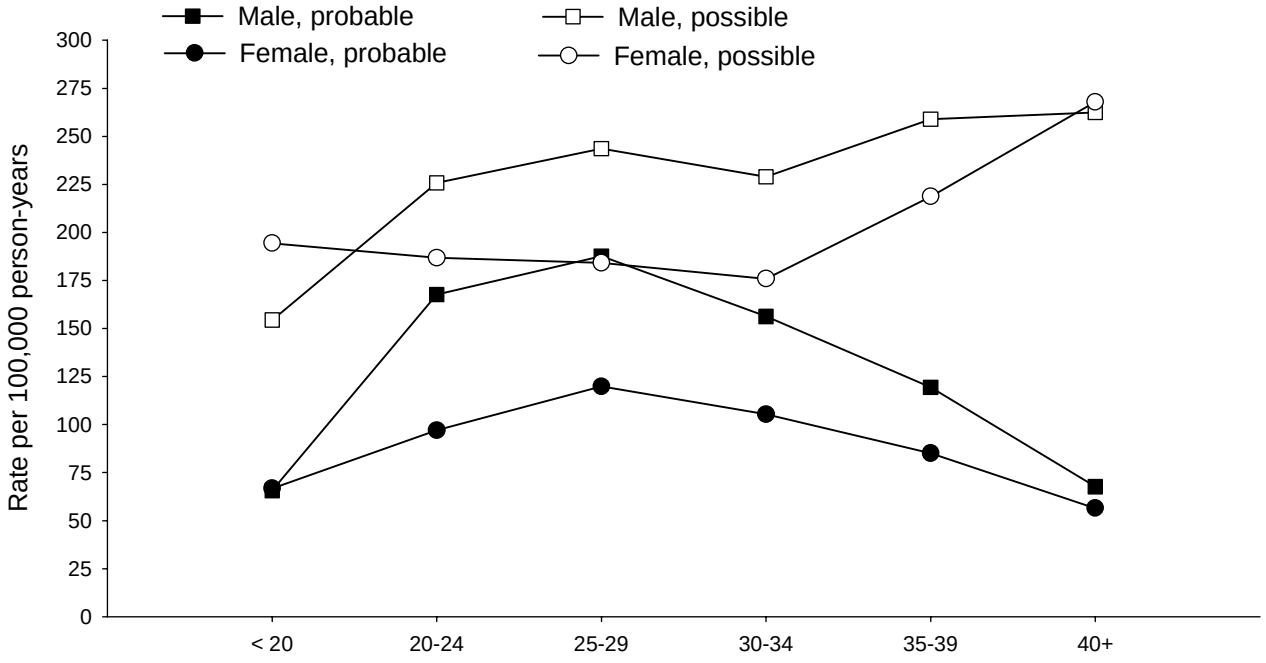


Figure 2. Incidence rates of "probable" and "possible" cruciate ligament tears, by gender and age group, active duty, US Armed Forces, 1990-2002.



and therapeutic interventions for cruciate ligament injuries (particularly in outpatient settings) improved.

Analysis by Karen E. Johnson, MS, Analysis Group, Army Medical Surveillance Activity.

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Cold Weather Injuries, Active Duty, US Army, 1998-2003

U.S. soldiers conduct worldwide training and operations during all seasons. In turn, they are exposed to a wide spectrum of weather conditions. Prolonged and/or intense exposures to cold can significantly degrade the health, well-being, and operational effectiveness of soldiers and their units. The U.S. military has developed extensive and effective countermeasures against threats associated with training and operations in cold environments.[1]

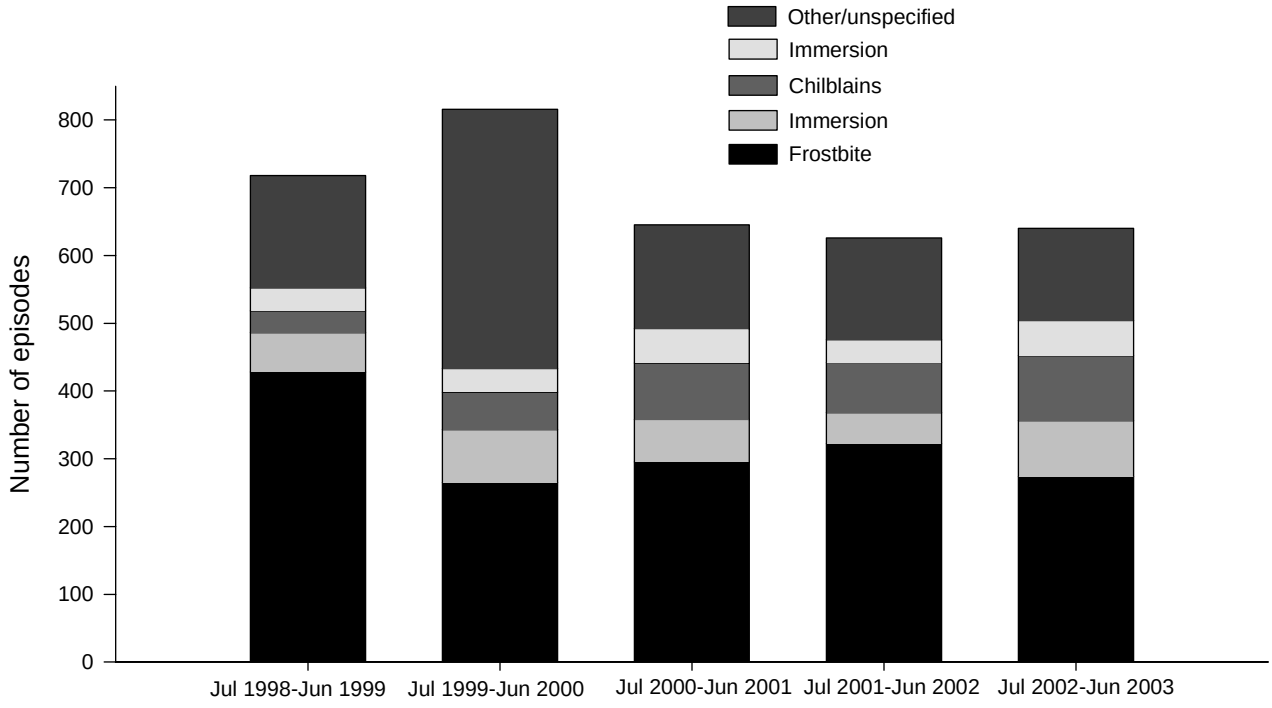
Cold weather injury-related diagnoses are routinely surveilled by the Army Medical Surveillance Activity (AMSA).[2] This report summarizes frequencies, rates, and correlates of risk of cold weather injuries among active duty soldiers during the past five cold weather seasons.

Methods. The surveillance period was defined as 1 July 1998 to 30 June 2003. The active service of all soldiers in the U.S. Army at any time during the surveillance period was included in analyses. For summary purposes, years were divided into 1 July through 30 June intervals (in order to include complete cold weather seasons in each yearly interval).

Inpatient, outpatient, and reportable medical event records in the Defense Medical Surveillance System (DMSS) were searched to identify all diagnoses related to the "effects of reduced temperature" (International Classification of Diseases, 9th Revision, clinical modifications (ICD-9-CM 991.1-991.9) during the surveillance period. To exclude follow-up medical encounters for single cold injury episodes, only one diagnosis per individual per year was included in the analysis. Thus, for surveillance purposes, a case was defined as an active duty soldier with a cold injury-related diagnosis (primary or any other) during a specific year of surveillance. Case counts, rates, and trends were summarized in relation to general military and demographic characteristics.

Results. During the 5-year period, there were 3,446 cold injury-related episodes reported among active duty soldiers. During the period, 92% of all cold

Figure 1. Episodes of cold related injuries, by type, active duty, US Army, by year, July 1998-June 2003.



injuries were primary diagnoses. Overall and during each year of the period, the most frequently reported cold injury was "frostbite" (46% for the entire period; 43% in 2002-2003) (table, figure 1).

After a small peak in 1999-2000, numbers and rates of cold injuries were remarkably stable (figure 1). During the 2002-2003 season, 640 cold injuries (18.6% of the total) were reported. The overall rate in 2002-2003 was 131.5 episodes per 100,000 person-years.

Overall (and in each year), cold injury rates were 2-3 times higher among males than females; were highest among soldiers younger than 20 years and declined monotonically with age; were much higher among black soldiers than white, Hispanic, or other soldiers; and were higher among junior enlisted than senior enlisted soldiers or officers (table 1).

Finally, in the past year, the Army installations with the most cold injuries were Fort Wainwright, Alaska (n=71); Fort Bragg, North Carolina (n=37); and Fort Drum, New York (n=23). There were 34 and 27 cold injuries among soldiers assigned in Korea and Europe, respectively (figure 2).

Editorial comment. This report documents that numbers and rates of cold injuries among US soldiers have remained remarkably stable over the past 3 years. Black soldiers, female soldiers, and the youngest (and thus most inexperienced) enlisted soldiers remain at significantly higher risk of cold injuries relative to their counterparts. The Disease Prevention and Control Program of the U.S. Army Center for Health Promotion and Preventive Medicine in collaboration with the U.S. Army Research Institute of Environmental Medicine provides a variety of cold injury prevention materials (including posters, presentation outlines, policies, regulations, and

Table 1. Cold injury-related episodes, active duty, US Army, by type, July 1998-June 2003

	Frostbite		Immersion		Chilblains		Hypothermia		Other/ Unspecified		Total	
	Cases	Rate*	Cases	Rate*	Cases	Rate*	Cases	Rate*	Cases	Rate*	Cases	Rate*
Gender												
Male	1,153	57.1	281	13.9	234	11.6	177	8.8	668	33.1	2,513	124.4
Female	432	119.7	45	12.5	106	29.4	29	8.0	319	88.4	931	258.0
Age group												
<20	175	84.1	48	23.1	44	21.2	40	19.2	155	74.5	462	222.1
20-29	984	77.5	221	17.4	239	18.8	124	9.8	604	47.6	2,172	171.1
30-39	379	54.9	47	6.8	47	6.8	28	4.1	201	29.1	702	101.7
40-49	44	22.3	10	5.1	10	5.1	11	5.6	28	14.2	103	52.2
50-59	3	15.9	1	5.3	0	0.0	3	15.9	0	0.0	7	37.2
Race/ethnicity												
White	540	38.9	178	12.8	152	11.0	95	6.9	398	28.7	1,363	98.3
Black	855	137.8	97	15.6	150	24.2	73	11.8	434	69.9	1,609	259.3
Hispanic	87	40.4	32	14.9	22	10.2	21	9.7	84	39.0	246	114.2
Other	103	63.6	20	12.3	16	9.9	17	10.5	72	44.4	228	140.7
Rank												
E1-4	1,055	95.7	217	19.7	212	19.2	139	12.6	666	60.4	2,289	207.6
E5-9	463	51.8	81	9.1	79	8.8	46	5.1	287	32.1	956	106.9
Officer	67	17.3	29	7.5	49	12.6	21	5.4	35	9.0	201	51.9
Cold year												
1998-1999	428	90.5	58	12.3	32	6.8	34	7.2	166	35.1	718	151.9
1999-2000	265	56.1	78	16.5	55	11.6	35	7.4	383	81.1	816	172.8
2000-2001	295	62.0	63	13.2	83	17.4	51	10.7	153	32.2	645	135.6
2001-2002	322	67.5	46	9.6	74	15.5	34	7.1	150	31.4	626	131.1
2002-2003	274	56.3	82	16.8	96	19.7	52	10.7	136	27.9	640	131.5
Total	1,585	66.5	327	13.7	340	14.3	206	8.6	988	41.4	3,446	144.5

* Rate calculated per 100,000 person-years

technical bulletins) at the following website: http://chppm-www.apgea.army.mil/coldinjury/.

Analysis and report by Jamease Kowalczyk, MPH, Analysis Group, Army Medical Surveillance Activity.

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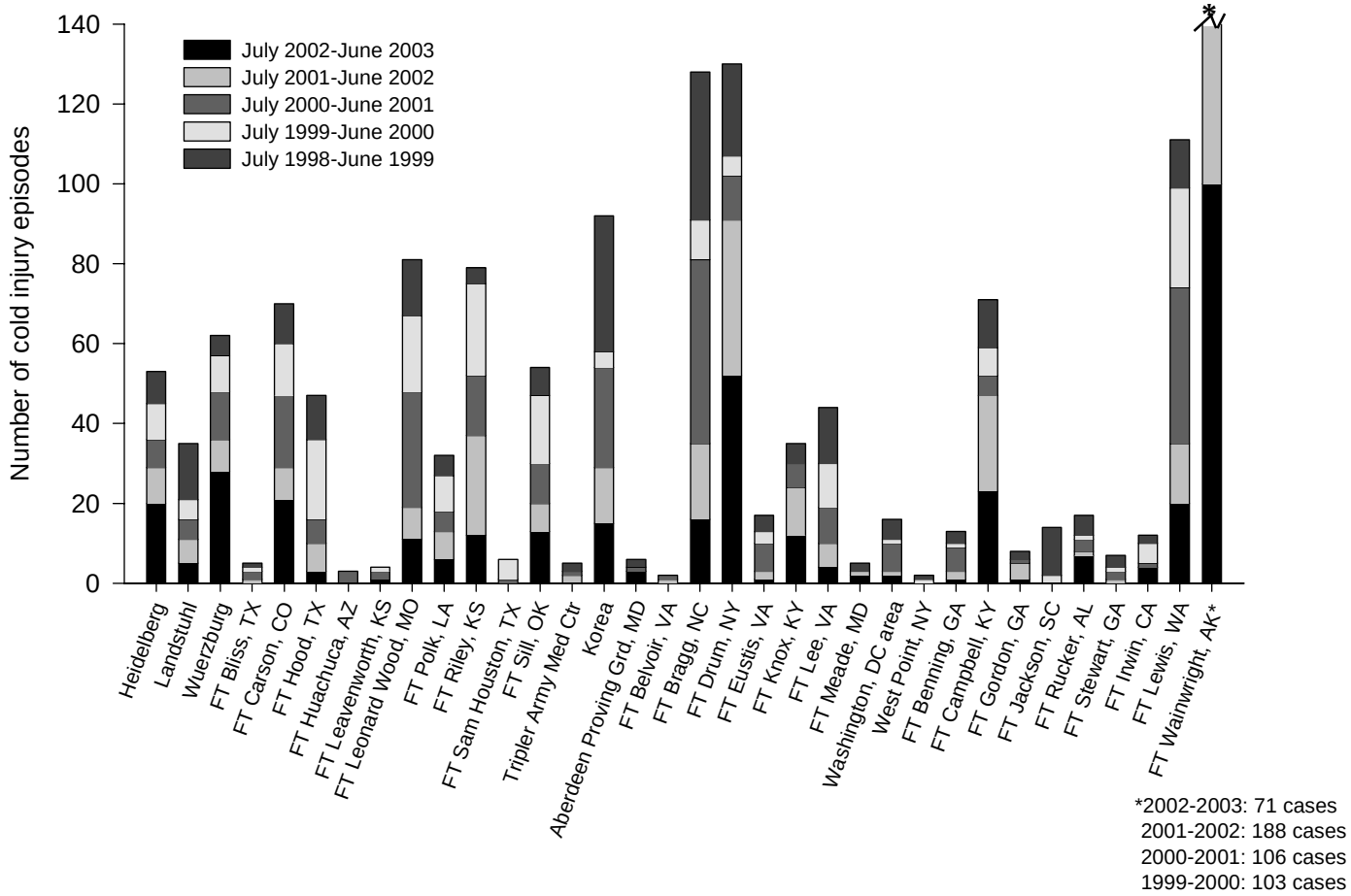
Figure 2. Cold injury episodes, by installation/location, active duty, US Army by year, July1998-June 2003.



*2002-2003: 71 cases
2001-2002: 188 cases
2000-2001: 106 cases
1999-2000: 103 cases

Update: Pre- and Post-deployment Health Assessments, US Armed Forces, September 2002-September 2003

The June 2003 issue of the MSMR summarized the background of, rationale for, and applicable polices and guidelines related to pre- and post-deployment health assessments of deploying servicemembers.[1-10] Briefly, prior to deploying, the health of each servicemember is assessed to ensure his/her medical fitness and readiness for deployment; and at the time of redeployment, the health of each servicemember is again assessed to identify medical conditions and/or exposures of concern—to ensure timely and comprehensive evaluation and treatment.

Completed pre- and post-deployment health assessment forms are routinely sent to the Army Medical Surveillance Activity (AMSA) where they are scanned, data entered, and archived in the Defense Medical Surveillance System (DMSS).[11] In the DMSS, data recorded on pre- and post-deployment forms are integrated with data that document demographic and military characteristics and medical experiences (e.g., hospitalizations, ambulatory visits, immunizations) of servicemembers.[11] The continuously expanding integrated DMSS database can be used to monitor the health of servicemembers who participate in various deployments.[11-13]

The overall success of deployment force health protection efforts depends in part on the completeness and quality of pre- and post-deployment health assessments. This report summarizes characteristics of servicemembers who completed pre- (since 1 September 2002) and post- (since 1 January 2003) deployment forms, responses to selected questions on pre- and post-deployment forms, and changes in responses of individuals from pre- to post-deployment.

Methods. For this update, the DMSS was searched to identify all pre- and post-deployment forms that were completed after 1 September 2002 (in order that assessments of servicemembers who deployed in October 2002 were included in analyses). For summary purposes, pre-deployment responses included all assessments (DD Form 2795) completed after 1 September 2002, and post-deployment responses included all assessments (DD Form 2796) completed after 1 January 2003.

Results. From 1 September 2002 to 30 September 2003, 403,952 pre-deployment health assessment forms were completed at field sites, shipped to AMSA, and entered into the DMSS database—approximately 60% were completed in January, February, or March (table 1).

From 1 January to 30 September 2003, 271,725 post-deployment health assessments were completed at field sites, shipped to AMSA, and entered into the DMSS database—more than two-thirds (69%) were completed in May, June, or July (table 1).

In general, the distributions of self-assessments of "overall health status" were similar among pre- and post-deployment form respondents (figure 1). Relatively more pre-deployment (31.9%) than post-deployment (24.7%) respondents assessed their "overall health" as "excellent"; nearly identical proportions (40-42%) of respondents to each of the forms assessed their "overall health" as "very good"; and before and after deploying, 5% or fewer respondents assessed their overall health as "fair" or "poor" (figure 1).

On post-deployment forms, approximately 25% of active and 34% of Reserve component respondents reported "medical/dental problems"; and approximately 4% of respondents overall reported "mental health concerns"(table 2). Twenty to 25% of post-deployment forms overall documented that "referrals" were indicated (table 2).

Among servicemembers (n=127,230) who completed both forms, approximately half (49.6%) chose the same descriptor of their "overall health status" before and after deploying (figures 2, 3). Of those (n=64,154) who changed their health status assessments from pre- to post-deployment, more than three-fourths (78.5%) changed by a single category (on a five category scale) (figure 2,3); and of those who changed by more than one category, approximately 7-times more indicated a decrement (n=12,071) than an improvement (n=1,723) in overall health (figure 3).

Figure 1. Percent distributions of self-assessed overall health status, pre- and post-deployment health forms, US Armed Forces, September 2002-2003.

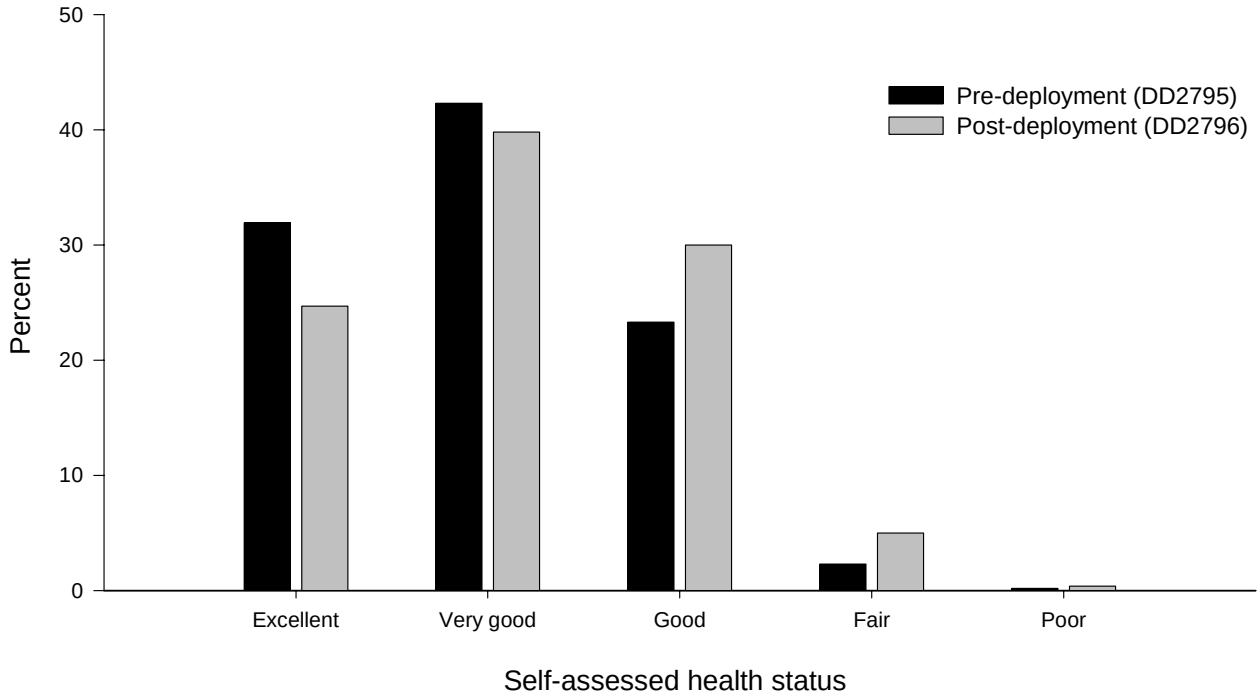


Table 1. Total pre-deployment and post-deployment health assessments, by month and year, US Armed Forces

	Pre-deployment *		Post-deployment **	
	No.	%	No.	%
Total	403,925	100.0	271,725	100.0
2002				
September	10,990	2.7	-	-
October	16,418	4.1	-	-
November	18,919	4.7	-	-
December	15,904	3.9	-	-
2003				
January	67,188	16.6	5,126	1.9
February	107,033	26.5	4,367	1.6
March	67,977	16.8	5,847	2.2
April	34,804	8.6	15,732	5.8
May	11,058	2.7	81,276	29.9
June	13,761	3.4	60,798	22.4
July	14,596	3.6	45,499	16.7
August	14,137	3.5	30,150	11.1
September	11,140	2.8	22,930	8.4

* Total pre-deployment assessments (DD form 2795), 1 September 2002 - 30 September 2003.

** Total post deployment assessments (DD form 2796), 1 January 2003 - 30 September 2003.

Overall, 9.6% of all servicemembers who completed post-deployment forms reported deployment-related "exposure concerns." The likelihood of reporting an "exposure concern" increased monotonically with age (table 3). In general, reservists, members of the Marine Corps and Army, and officers were more likely to report "exposure concerns" than their respective counterparts (table 3).

Editorial comment. In general, servicemembers who have been mobilized/deployed since October 2002 have assessed their overall health as "good" to "excellent." The distributions of self-assessed health statuses are generally similar prior to and after returning from deploying; however, more servicemembers reported declines than improvements in their overall health from pre- to post-deployment. This is not surprising considering the extreme physical and psychological stresses associated with mobilization, overseas deployment, and harsh and dangerous living and working conditions.[14] The deployment health assessment process is specifically designed to identify, assess, and follow-up as necessary all servicemembers with concerns regarding health and/or deployment-related exposures.

Overall, approximately one of every 11 servicemembers who completed post-deployment health assessments reported an "exposure concern." Of demographic factors, the strongest correlate of reporting an exposure concern was older age. The higher crude prevalences of exposure concerns among reservists (versus active component) and officers (versus enlisted), for example, may be related at least in part to differences in the age distributions of the respective groups. Trends in the numbers and natures of deployment-related "exposure concerns" will be monitored as more servicemembers return from over-

Table 2. Reponses to selected questions from post-deployment forms (DD2796) completed since 1 January 2003, by service and component, US Armed Forces*

Active component	Army	Navy	Air Force	Marines	Total
SMs with DD 2796 at AMSA	70,345	26,763	31,733	37,855	166,696
General health ("fair" or "poor")	9%	5%	2%	6%	6%
Medical/dental problems	25%	13%	11%	18%	19%
Currently on profile	12%	1%	2%	3%	6%
Mental health concerns	4%	2%	1%	2%	3%
Exposure concerns	15%	7%	6%	12%	11%
Health concerns	14%	7%	5%	8%	10%
Referral indicated	25%	8%	11%	11%	14%
Med. visit following referral**	91%	65%	83%	53%	81%
Post deployment serum***	90%	65%	93%	63%	83%
Reserve component					
SMs with DD 2796 at AMSA	59,539	9,017	14,019	9,932	92,507
General health ("fair" or "poor")	9%	5%	3%	11%	8%
Medical/dental problems	34%	34%	18%	38%	31%
Currently on profile	15%	5%	2%	4%	11%
Mental health concerns	4%	2%	1%	3%	3%
Exposure concerns	17%	13%	10%	32%	17%
Health concerns	18%	19%	9%	26%	17%
Referral indicated	20%	17%	15%	30%	15%
Med. visit following referral**	44%	79%	23%	47%	45%
Post deployment serum***	87%	77%	72%	70%	83%

* As of 12 December 2003.

** Inpatient or outpatient visit within 6 months after referral.

*** Only calculated for DD 2796 completed since 1 June 2003.

Note: Subgroup totals may not equal the overall total due to missing/unknown data.

seas assignments and/or demobilize.

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Figure 2. Self-assessed health status on post-deployment form, in relation to self assessed health status pre-deployment, US Armed Forces, September 2002-September 2003.

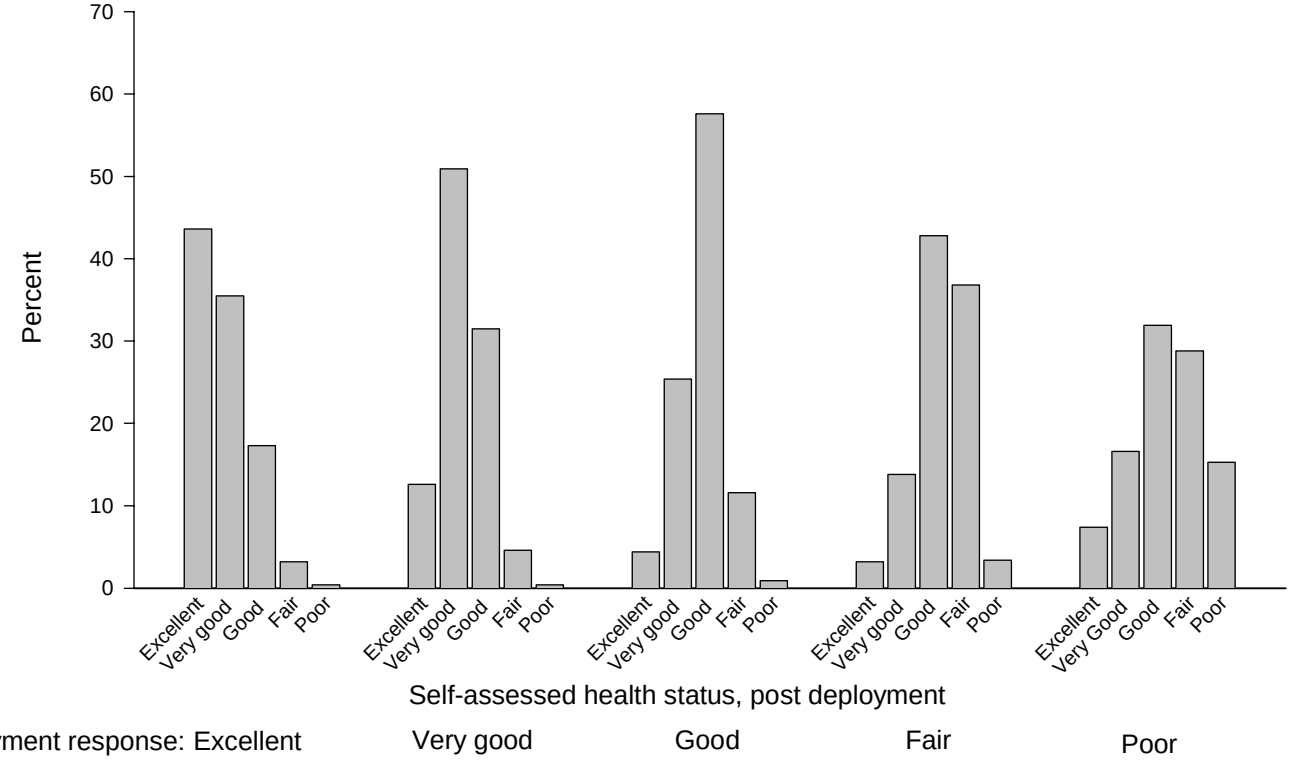


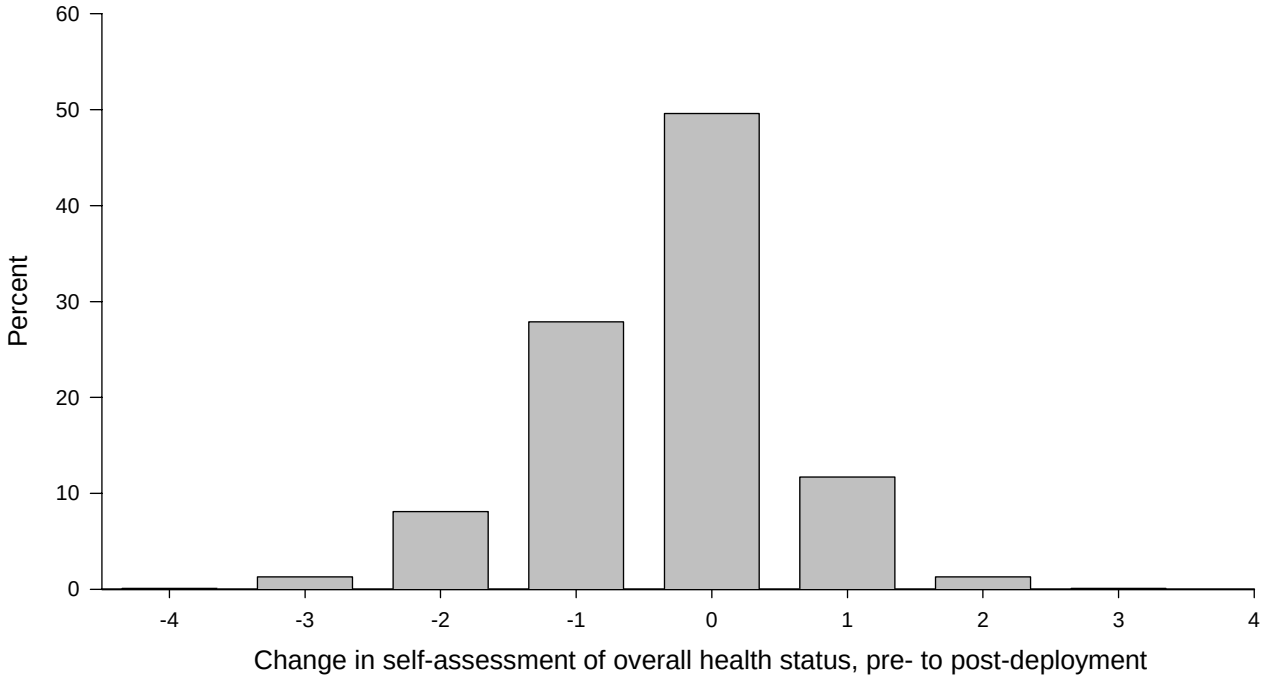
Table 3. Deployment related "exposure concerns" reported on post-deployment health assessments*, US Armed Forces, January-September 2003.

	Total respondents	Exposure concerns no.	Exposure concerns %
Total	233,270	22,343	9.6
Component			
Active	154,031	17,378	11.3
Reserve	79,048	13,080	16.5
Service			
Army	111,176	16,845	15.2
Navy	33,286	2,842	8.5
Air Force	42,580	3,111	7.3
Marines	46,228	7,697	16.7
Age (years)			
<20	9,075	661	7.3
20-29	122,933	14,184	11.5
30-39	64,634	9,520	14.7
>39	36,628	6,130	16.7
Gender			
Men	207,522	26,880	13.0
Women	25,745	3,615	14.0
Race/ethnicity			
Black nonhispanic	41,650	5,810	13.9
Hispanic	22,914	3,345	14.6
Other	2,869	529	18.4
White nonhispanic	153,993	19,369	12.6
Grade			
Enlisted	201,746	25,716	12.7
Officer	31,504	4,774	15.2

* Post-deployment health assessments (DD Form 2796) with completion dates: 1 January - 30 September 2003.

**Total does not reflect missing responses to exposure concerns or missing characteristics.

Figure 3. Distribution of self-assessed health status changes from pre- to post-deployment form, US Armed Forces, September 2002-2003.



Change in self-assessment of overall health status, pre- to post-deployment, was calculated as: post deployment health staus - pre-deployment health status, using the following scale for health status: 1= "poor"; 2="fair"; 3="good"; 4="very good"; and 5="excellent."

Sentinel reportable events for all beneficiaries[1] at US Army medical facilities, cumulative numbers[2] for calendar years through December 31, 2002 and 2003

Reporting location	Number of reports all events[3]		Food-borne								Vaccine Preventable					
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella	
	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
NORTH ATLANTIC																
Washington, DC Area	234	415	6	.	6	5	7	3	7	3	2	.	.	.	1	2
Aberdeen, MD	52	103	1	.	1	.	.	.	1	.	.	.	1	.	.	.
FT Belvoir, VA	224	279	9	10	4	4	8	11	3	4	.	.	.	.	.	.
FT Bragg, NC	2,229	1,916	11	8	.	.	45	30	62	20	.	.	1	.	.	2
FT Drum, NY	165	204	1	.	.	1	.	.	.	.	.	.	.	.	.	2
FT Eustis, VA	287	471	3	.	.	.	3	1	9	.	.	.	1	.	2	2
FT Knox, KY	232	256	5	3	4	.	4	5	.	.	.	.	.	.	.	1
FT Lee, VA	233	218	.	.	.	.	1	2	.	.	.	.	.	.	.	.
FT Meade, MD	121	117	.	.	1	1	1	.	.	1	.	.	.	.	1	.
West Point, NY	114	86	.	2	.	.	3	2	.	.	2	1	1	1	2	.
GREAT PLAINS																
FT Sam Houston, TX	322	219	.	.	.	.	2	6	.	.	.	.	.	.	.	.
FT Bliss, TX	251	445	.	2	5	4	5	3	2	1	.	.	2	2	.	1
FT Carson, CO	643	688	8	14	8	7	4	3	4	2	.	4	3	.	.	1
FT Hood, TX	2,290	1,876	4	9	.	.	17	28	12	107	.	1	.	1	.	.
FT Huachuca, AZ	68	77	.	.	.	.	1	.	.	.	.	.	.	.	.	.
FT Leavenworth, KS	54	48	.	2	3	.	.	1	1	1	1	.	.	.	.	.
FT Leonard Wood, MO	237	226	.	6	.	.	3	1	.	.	.	.	.	1	4	4
FT Polk, LA	232	223	.	1	.	.	6	3	1	1	.	.	.	2	.	.
FT Riley, KS	291	253	.	4	.	6	1	1	.	.	.	1	.	2	1	.
FT Sill, OK	337	258	1	.	.	.	.	.	5	1	.	.	.	.	.	.
SOUTHEAST																
FT Gordon, GA	245	326	.	.	.	1	.	3	3	.	1	.	1	2	.	.
FT Benning, GA	562	494	.	1	3	6	31	9	2	8	.	.	.	.	3	.
FT Campbell, KY	740	491	4	4	1	8	4	4	2	1	.	.	.	.	3	.
FT Jackson, SC	264	247	.	.	.	.	.	1	.	.	.	1	1	.	1	.
FT Rucker, AL	80	74	1	.	.	.	3	6	2	7	.	2	.	1	.	.
FT Stewart, GA	590	356	1	.	3	.	12	16	3	14	.	.	.	.	1	1
WESTERN																
FT Lewis, WA	761	737	3	3	1	7	6	7	1	3	.	1	.	.	.	.
FT Irwin, CA	68	61	.	.	.	.	.	.	.	.	.	.	1	.	.	.
FT Wainwright, AK	142	200	1	2	1	.	1	1	.	.	.	.	.	.	.	.
OTHER LOCATIONS																
Hawaii	899	1,088	42	24	12	9	14	11	1	4	.	.	2	2	.	1
Europe	2,154	1,469	34	19	.	.	44	19	3	1	1	9	6	1	5	3
Korea	596	581	3	.	.	.	8	2	.	.	1	1	1	1	1	6
Total	**15,717**	**14,502**	**138**	**114**	**53**	**59**	**234**	**179**	**124**	**179**	**8**	**21**	**21**	**16**	**25**	**26**

1. Includes active duty servicemembers, dependents, and retirees.

2. Events reported by January 7, 2002 and 2003.

3. Seventy events specified by Tri-Service Reportable Events, Version 1.0, July 2000.

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

(Cont'd) Sentinel reportable events for all beneficiaries[1] at US Army medical facilities, cumulative numbers[2] for calendar years through December 31, 2002 and 2003

Reporting location	Arthropod-borne				Sexually Transmitted								Environmental			
	Lyme Disease		Malaria		Chlamydia		Gonorrhea		Syphilis[3]		Urethritis[4]		Cold		Heat	
	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
NORTH ATLANTIC																
Washington, DC Area	5	2	2	2	97	162	23	24	6	3	.	.	.	1	2	.
Aberdeen, MD	2	2	.	.	43	40	3	12	.	.	.	.	.	9	.	.
FT Belvoir, VA	3	2	.	1	154	196	34	40	1	.	.	.	.	.	2	1
FT Bragg, NC	.	1	4	8	1,559	1,308	297	264	1	6	125	111	1	5	110	79
FT Drum, NY	.	.	2	.	109	133	29	25	.	1	.	.	10	4	14	.
FT Eustis, VA	1	.	.	.	212	188	51	44	1	1	.	.	.	.	3	.
FT Knox, KY	.	.	.	.	166	210	48	31	.	.	.	.	.	.	3	1
FT Lee, VA	2	.	.	.	192	142	36	27	.	.	.	.	.	.	2	.
FT Meade, MD	5	.	.	.	95	95	15	20	.	.	2	.	.	.	.	.
West Point, NY	40	37	.	.	18	25	9	3	1	.	.	.	.	1	37	8
GREAT PLAINS																
FT Sam Houston, TX	.	.	.	.	246	169	48	33	.	1	.	.	.	.	2	.
FT Bliss, TX	.	.	.	.	153	283	27	60	1	2	.	.	.	.	1	1
FT Carson, CO	.	.	3	.	446	382	53	39	1	1	64	41	1	2	.	1
FT Hood, TX	.	.	5	3	1,251	919	440	281	4	5	406	202	1	5	40	11
FT Huachuca, AZ	.	.	.	1	55	71	10	5	.	.	.	.	.	.	2	.
FT Leavenworth, KS	.	.	1	1	35	37	11	3	.	.	.	.	.	.	.	.
FT Leonard Wood, MO	.	.	1	.	167	183	38	22	.	1	2	.	3	2	12	3
FT Polk, LA	.	.	1	1	153	162	62	45	3	.	.	.	.	.	1	8
FT Riley, KS	.	.	2	.	219	197	51	10	.	.	.	.	12	.	3	4
FT Sill, OK	.	.	2	.	193	148	59	21	.	1	55	32	1	.	19	4
SOUTHEAST																
FT Gordon, GA	2	.	1	2	195	277	30	24	1	5	.	.	.	.	1	2
FT Benning, GA	.	.	1	29	286	265	135	117	1	.	.	.	.	.	94	57
FT Campbell, KY	1	1	2	2	528	355	161	92	1	1	.	.	1	2	24	9
FT Jackson, SC	.	.	.	.	215	180	42	33	1	.	.	.	2	5	2	22
FT Rucker, AL	.	.	1	.	50	39	18	12	.	.	.	1	.	.	5	4
FT Stewart, GA	3	.	1	2	358	173	150	85	2	.	11	35	.	.	42	14
WESTERN																
FT Lewis, WA	.	.	3	2	534	383	85	75	2	.	112	89	.	1	.	2
FT Irwin, CA	.	.	.	.	53	47	12	13	.	.	.	.	.	.	1	.
FT Wainwright, AK	1	.	.	1	111	117	8	25	.	.	.	.	14	34	.	.
OTHER LOCATIONS																
Hawaii	.	.	2	2	648	747	100	133	1	1	.	.	.	.	12	21
Europe	9	5	10	8	1,571	1,059	431	246	6	2	3	1	13	4	8	33
Korea	.	.	20	19	415	442	116	68	1	3	1	8	8	5	14	12
Total	**74**	**50**	**64**	**84**	**10,527**	**9,134**	**2,632**	**1,932**	**35**	**34**	**781**	**520**	**67**	**80**	**456**	**297**

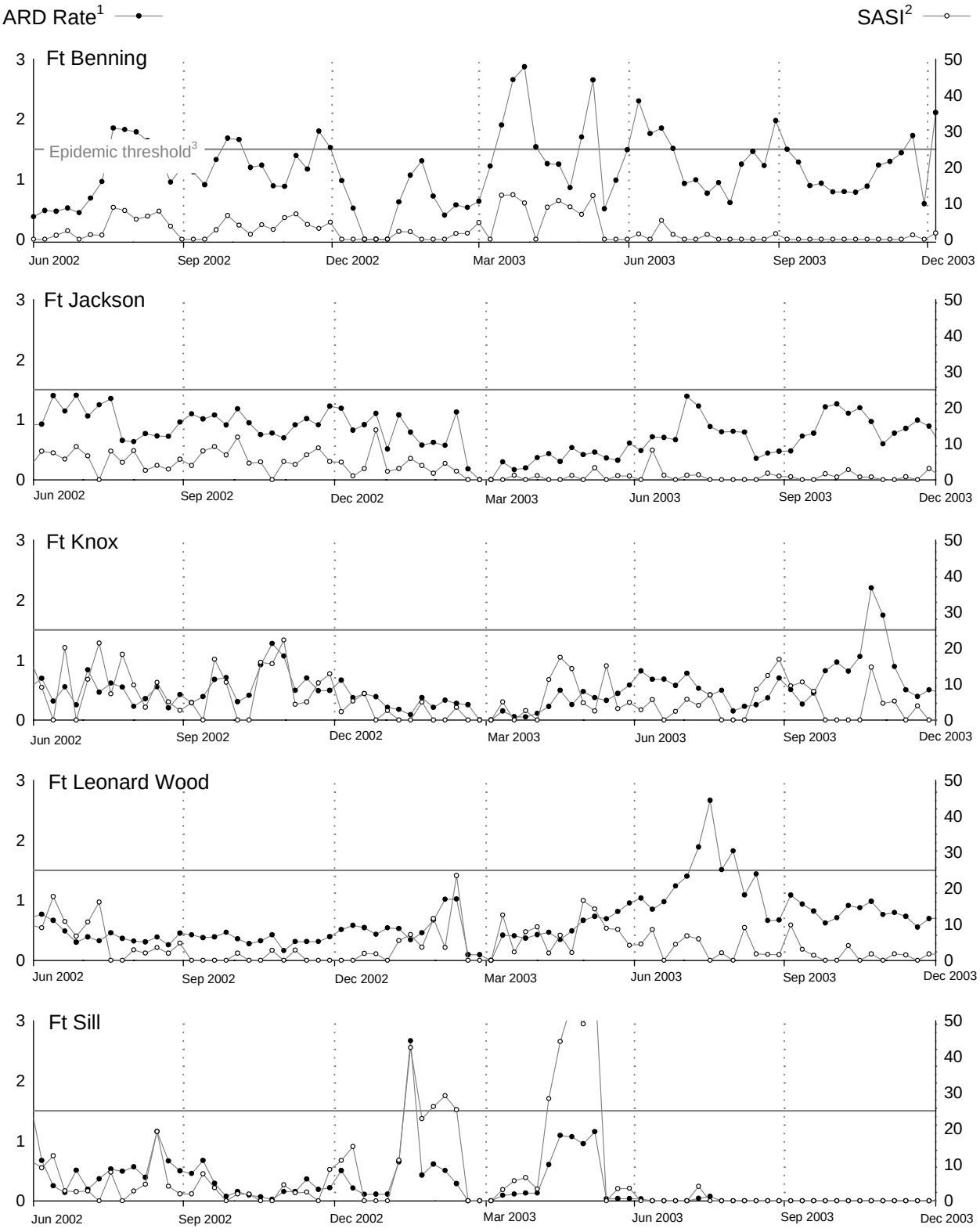
3. Primary and secondary.

4. Urethritis, non-gonococcal (NGU).

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

Acute respiratory disease (ARD) and streptococcal pharyngitis (SASI), Army Basic Training Centers, by week through December 27, 2003



[1]ARD rate = cases per 100 trainees per week

[2]SASI (Strep ARD surveillance index) = (ARD rate)x(rate of Group A beta-hemolytic strep)

[3]ARD rate >=1.5 or SASI >=25.0 for 2 consecutive weeks indicates an "epidemic"

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